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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/623,847

07/21/2003

Daniel R. Paquette

12078-195

6422

26486 7590 03/27/2008
BURNS & LEVINSON, LLP
125 SUMMER STREET
BOSTON, MA 02110

EXAMINER

SETH, MANAV

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

03/27/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Interview Summary	Application No. 10/623,847	Applicant(s) PAQUETTE ET AL.	
	Examiner Damon Conover	Art Unit 2624	

All participants (applicant, applicant's representative, PTO personnel):

(1) Damon Conover. (3) _____

(2) Orlando Lopez, Reg. No. 46,880. (4) _____

Date of Interview: 08 January 2008.

Type: a) ☒ Telephonic b) ☐ Video Conference
c) ☐ Personal [copy given to: 1) ☐ applicant 2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No.
If Yes, brief description: _____

Claim(s) discussed: _____

Identification of prior art discussed: _____

Agreement with respect to the claims f) ☐ was reached. g) ☒ was not reached. h) ☐ N/A.

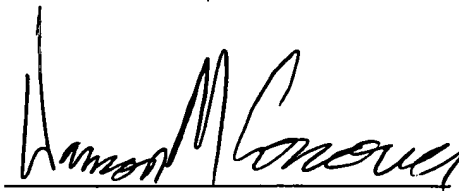
Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: See Continuation Sheet.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.


BRIAN WERNER
SUPERVISORY PATENT EXAMINER

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.


Examiner's signature, if required

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: The attorney for the applicant made the following arguments: 1) the edge marks in Hirose et al. are areas, not lines, 2) the combination of Hirose et al., Matsumoto et al., and Fujieda is improper because it would render the primary reference inoperable for its intended purpose, and 3) the Official Notice used to reject claim 6 is improper.

The examiner continues to believe that the edge marks in Hirose et al. can be read as lines. The attorney will consider amending the independent claims such that it is clear that the edges of the chevrons (same as edge marks) are extracted, and it is these edges which define the line segment data.

The examiner continues to believe that the combination of Hirose et al., Matsumoto et al., and Fujieda is proper. The limitations in the independent claims appear to be independent steps for extracting and identifying a plurality of lines. Because the steps do not depend on each other, the examiner believes that it is proper to use Hirose et al. to teach identifying collinear lines with one histogram and to use Matsumoto et al. to teach identifying intersecting lines with a second histogram. Additionally, the examiner believes that it is proper to add Fujieda to the combination to teach that angle information may be used to identify collinear lines. The attorney will consider amending the independent claims to be more specific in the description of the applicants' invention.

The examiner will provide a reference supporting his claim of Official Notice in the rejection of claim 6 in the next office action.

DMC

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FACSIMILE TRANSMITTAL

Date: January 7, 2008Client/Matter: 37791-00195Attorney No: 2120

To

Examiner Damon Conover

Facsimile Number:

571-273-5448

Telephone Number:

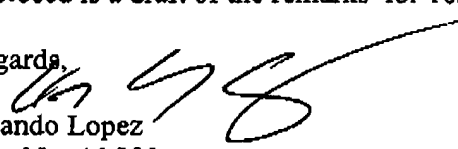
571-272-5448From: Orlando LopezNumber of Pages (including cover): 46

Message:

Examiner Conover:

Enclosed is a draft of the remarks for 10/623,847.

Regards,


Orlando Lopez
Reg. No. 46,880

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DRAFT

CERTIFICATE OF ELECTRONIC FILING

I hereby certify that this correspondence is being electronically filed with the U.S. Patent and Trademark Office, addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this date: January, 2008.

Orlando Lopez
Reg. No. 46,880

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Daniel R. Paquette et al.
Application Serial Number: 10/623,847
Filed: July 21, 2003

Examiner: Conover
Group Art Unit: 2624
Confirm. No. 6422

For: METHODS AND SYSTEMS FOR DETECTION OF REPEATING PATTERNS OF
FEATURES

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AMENDMENT AND RESPONSE UNDER 37 CFR 1.111 TO OFFICE ACTION

Sir:

In response to the non-final Office Action dated October 29, 2007, please amend the above-identified application as follows:

Amendments to the Claims begin on page 2 of this paper.

Remarks/Arguments begin on page 6 of this paper.

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Amendment and Response dtd. 1/ /08
Response to Office Action of 10/29/07

Amendments to the Claims:

This listing of the claims will replace all prior versions, and listings, of the claims in the application.

Listing of Claims:

1. (Currently amended) A method for detecting features on an item, the method comprising the steps of:
acquiring a digital image of the item;
obtaining pixel data for a plurality of pixels in the digital image;
extracting line segment data from the pixel data, said line segment data comprising line segment angle data;
identifying a plurality of collinear line segments from the line segment data;
identifying a plurality of intersecting lines from the line segment data; and,
identifying a plurality of features comprising the plurality of intersecting lines and the plurality of collinear lines;
~~wherein~~ the intersecting lines intersecting lines from the plurality of collinear lines.
2. (Original) The method of claim 1 further comprising the steps of:
verifying that each collinear line segment from the plurality of collinear line segments has characteristic properties of an element of the plurality of collinear line segments; and,

removing from the plurality of collinear line segments each collinear line segment that does not have characteristic properties of an element of the plurality of collinear lines segments.
3. (Original) The method of claim 1 wherein the step of identifying the plurality of collinear line segments from the line segment data comprises the step of:
constructing a histogram displaying a number of line segments in a predetermined angular range from a plurality of predetermined angular ranges.

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4. (Original) The method of claim 1 further comprising the step of:
verifying that the identified plurality of features is located at a preselected location on the item.
5. (Original) The method of claim 1 further comprising the steps of:
identifying a subsequent plurality of collinear line segments from the line segment data;
identifying a subsequent plurality of intersecting lines from the line segment data; and,
identifying a subsequent plurality of features comprising the subsequent plurality of intersecting lines and the subsequent plurality of collinear lines;
wherein the intersecting lines from the subsequent plurality of intersecting lines intersect the subsequent plurality of collinear lines.
6. (Original) The method of claim 5 further comprising the steps of:
determining whether the plurality of identified features and the subsequent plurality of identified features are substantially overlapping;
determining whether the plurality of identified features and the subsequent plurality of identified features have substantially similar collinearity; and,
merging the plurality of identified features and the subsequent plurality of identified features if the plurality of identified features and the subsequent plurality of identified features are substantially overlapping and have substantially similar collinearity.
7. (Original) The method of claim 4 wherein the item comprises a mail piece.
8. (Currently amended) A system for identifying features on an item comprising:
a digital image acquisition module capable of acquiring a digital image of the item;
at least one processor; and,
at least one computer readable memory having computer readable code embodied therein,
the computer readable code capable of causing the at least one processor to:
obtain pixel data for a plurality of pixels in the digital image;

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extract line segment data from the pixel data, said line segment data comprising line segment angle data;
identify a plurality of collinear line segments from the line segment data;
identify a plurality of intersecting lines from the line segment data; and,
identify a plurality of features comprising the plurality of intersecting lines and the plurality of collinear lines;
the intersecting lines intersecting the plurality of collinear lines.

9. (Original) The system of claim 8 wherein the computer readable code is further capable of causing the at least one processor to:
verify that each collinear line segment from the plurality of collinear line segments has characteristic properties of an element of the plurality of collinear line segments; and,

remove from the plurality of collinear line segments each collinear line segment that does not have characteristic properties of an element of the plurality of collinear lines segments.
10. (Original) The system of claim 8 wherein the computer readable code is further capable of causing the at least one processor to:
verify that the identified plurality of features is located at a preselected location on the item.
11. (Original) The system of claim 8 wherein the computer readable code is further capable of causing the at least one processor to:
identify a subsequent plurality of collinear line segments from the line segment data;
identify a subsequent plurality of intersecting lines from the line segment data; and,
identify a subsequent plurality of features comprising the subsequent plurality of intersecting lines and the subsequent plurality of collinear lines;
the intersecting lines from the subsequent plurality of intersecting lines intersecting the subsequent plurality of collinear lines.

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12. (Original) The system of claim 11 wherein the computer readable code is further capable of causing the at least one processor to:
determine whether the plurality of identified features and the subsequent plurality of identified features are substantially overlapping;
determine whether the plurality of identified features and the subsequent plurality of identified features have substantially similar collinearity; and,
merge the plurality of identified features and the subsequent plurality of identified features if the plurality of identified features and the subsequent plurality of identified features are substantially overlapping and have substantially similar collinearity.
13. (Original) The system of claim 10 wherein the item comprises a mail piece.
14. (Previously presented) A computer program product comprising:
a computer usable medium having computer readable code embodied therein, the computer readable code capable of causing a computer system to:
obtain pixel data for a plurality of pixels in a digital image;
extract line segment data from the pixel data, said line segment data comprising line segment angle data;
identify a plurality of collinear line segments from the line segment data;
identify a plurality of intersecting lines from the line segment data; and,
identify a plurality of features comprising the plurality of intersecting lines and the plurality of collinear lines;
the intersecting lines intersecting the plurality of collinear lines.
15. (Original) The computer program product of claim 14 wherein the computer readable code is further capable of causing the computer system to:
verify that each collinear line segment from the plurality of collinear line segments has characteristic properties of an element of the plurality of collinear line segments; and,

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remove from the plurality of collinear line segments each collinear line segment that does not have characteristic properties of an element of the plurality of collinear lines segments.

16. (Original) The computer program product of claim 14 wherein the computer readable code is further capable of causing the computer system to:
verify that the identified plurality of features is located at a preselected location on the item.
17. (Original) The computer program product of claim 14 wherein the computer readable code is further capable of causing the computer system to:
identify a subsequent plurality of collinear line segments from the line segment data;
identify a subsequent plurality of intersecting lines from the line segment data; and,
identify a subsequent plurality of features comprising the subsequent plurality of intersecting lines and the subsequent plurality of collinear lines;
the intersecting lines from the subsequent plurality of intersecting lines intersecting the subsequent plurality of collinear lines.
18. (Original) The computer program product of claim 17 wherein the computer readable code is further capable of causing the computer system to:
determine whether the plurality of identified features and the subsequent plurality of identified features are substantially overlapping;
determine whether the plurality of identified features and the subsequent plurality of identified features have substantially similar collinearity; and,
merge the plurality of identified features and the subsequent plurality of identified features if the plurality of identified features and the subsequent plurality of identified features are substantially overlapping and have substantially similar collinearity.

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Remarks/Arguments

The Office Action of May 3, 2007 has been carefully reviewed and this response addresses the Examiner's concerns.

I. Status of the Claims

Claims 1-18 are currently pending in this application.

Claims 14-18 are rejected under 35 USC 101 because the claimed invention is directed to nonstatutory subject matter.

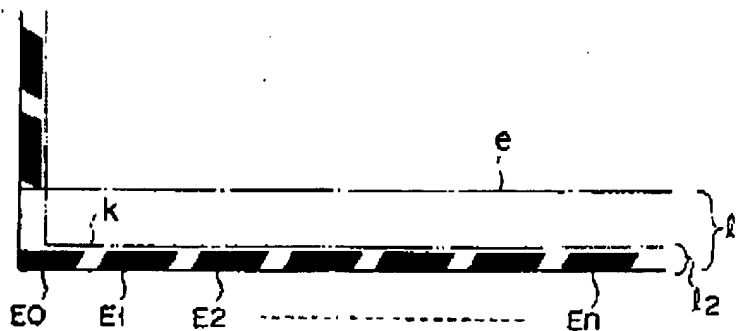
Claims 1--18 are rejected under 35 USC 103(a) as being unpatentable over Hirose et al. (US Patent 4,736,441- the '441 patent) and Matsumoto et al., US Patent 5,774,584-the '584 patent) in view of Fujieda (U.S. patent Publication 2002/0063893)..

II. Remarks

Applicants respectfully state that process of edge marks determination from a plurality of edge marks is not analogous to the process of identifying a plurality of collinear line segments from the line segment data

"Edge mark," as used in the '441 patent, refers to the entire mark area (see figure 8A of the '441 patent, which is shown below).

F I G. 8A



The other references to edges applied to the edges of the envelope (in col. 1, col. 6, lines 47-48 and line 53). The '441 patent also uses the term characteristic reference edge pattern to describe the edge marks) ranges (col. 5, lines 47-50).

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In the Applicants disclosure, these same marks are referred to as "Chevron marks." Rephrasing the Examiner statement, the Examiner alleges that the process of Chevron mark determination from a plurality of Chevron marks in the '441 patent is analogous to the process of identifying collinear line segments from line segment data. In the '441 patent, histograms of areas of the Chevron marks rebounded between the edge of the envelope and a predetermined line are used to determine the location of the Chevron marks. There is no reference into '441 patent to collinear line segments or lined segment data. Although some embodiments of the Applicants' method for identifying collinear line segments could use histograms, as understood by one skilled in the image processing or image identification art, areas are significantly different from line segments. Therefore, one skilled in the image processing or image identification art, would not find a process for determining the location of areas analogous to a process for identifying collinear line segments. Applicants respectfully traverse the Examiner's assertion. Applicants respectfully further refer the Examiner to MPEP 2144.03 and respectfully request that the Examiner "provide specific factual findings predicated on sound technical and scientific reasoning to support his or her conclusion of common knowledge." See *Soli*, 317 F.2d at 946, 37 USPQ at 801; *Chevenard*, 139 F.2d at 713, 60 USPQ at 241.

Applicants respectfully state that although the test for obviousness is that "the combined teachings of those references would have suggested to those of ordinary skill in the art," the claimed combination cannot change the principle of operation of the primary reference or render the reference inoperable for its intended purpose (MPEP 2145)

The Examiner, in his remarks, states that "the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor it is at the claimed invention must be especially suggested in any one or all of the preferences. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art," citing *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981).

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However, the claimed combination cannot change the principle of operation of the primary reference or render the reference inoperable for its intended purpose. (MPEP 2145). If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). (MPEP 2143.01)

Applicants respectfully state that concept and advantages of merging the same features that have been extracted from overlapping regions are not "capable of such instant and unquestionable demonstration as to defy dispute," and, therefore applicants respectfully traverse the Official Notice taken by the Examiner.

The actual concept and advantages of merging the same features that have been extracted from overlapping regions have to be examined in light of the problem being solved in order to actually determine whether or not there are advantages and in order to identify the actual concept being used. For example, in Jiqiang Song; Zuo Li; Lyu, M.R.; Shijie Ca, *Recognition of merged characters based on forepart prediction, necessity-sufficiency matching, and character-adaptive masking*, IEEE Transactions on Systems, Man, and Cybernetics, Part B, Volume 35, Issue 1, Date: Feb. 2005, Pages: 2-11, the merging relationship between overlapped characters presents a difficulty to be solved rather than an advantage. On the alternative, the merging process for coping with selecting photo semantics (features) on (extracted from) spatially overlapping local regions presented in Seungji Yang; Sang-Kyun Kim; Yong Man Ro, *Semantic Home Photo Categorization*, IEEE Transactions on Circuits and Systems for Video Technology, Volume 17, Issue 3, Date: March 2007, Pages: 324 – 335 does not have an application in the technical solution presented in the Applicants' specification.

Therefore, Applicants respectfully state that the Examiner's assertion is not properly based on common knowledge, and respectfully request that the Examiner provide documentary evidence

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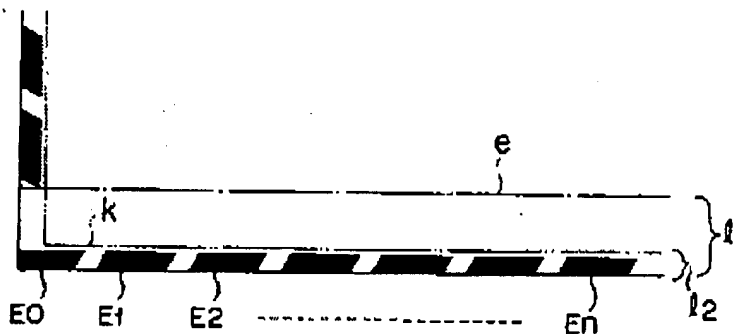
to support the assertion that the concept and advantages of merging the same features that have been extracted from overlapping regions are well-known and expected in the art.

III. Claim Rejections – 35 USC §103

Claims 1-2 and 4-18 are rejected under 35 USC 103(a) as being unpatentable over Hirose et al. (US Patent 4,736,441- the '441 patent) and Matsumoto et al. US Patent 5,774,584- the '584 patent) in view of Fujieda (U.S. patent Publication 2002/0063893).

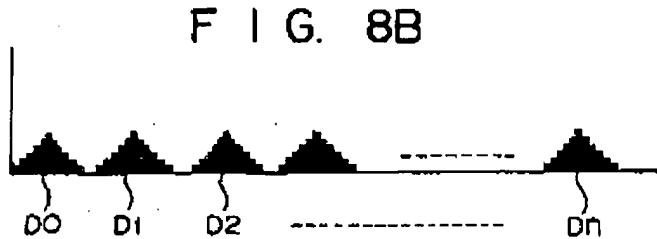
As the Examiner states, Hirose discloses a reading apparatus that can accurately determine the reverse/obverse of postal material and determine whether the postal material is right side up or upside down, in spite of partial overlapping of an edge mark with marks which are critical to these determinations. Hirose discloses that by scanning the surfaces of each envelope, imaging devices 14 and 15 obtain image data relating to stamp 2, address 4, airmail mark 5, edge mark E, return address 8 and seal 9, etc, referring to figures 1 and 2. In figures 1, 2 and 8A, Hirose defines the edge mark as referring to the entire mark area (see figure 8A of the '441 patent, which is shown below).

F I G. 8A

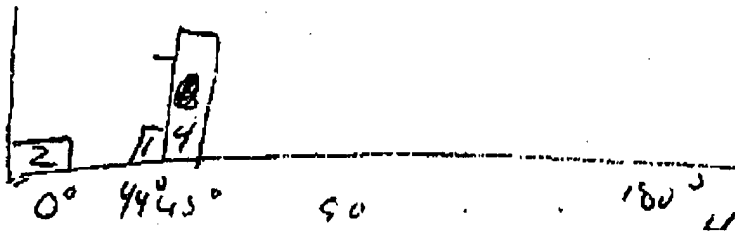


In the figure shown above, E0, E1, E2 to EN are indicated as denoting the area of the mark. Hirose teaches obtaining histograms related to the area of each mark, E0, E1, E2 to EN, colintersected by a line located at a distance d_1 from the edge of the envelope. The resulting histograms, shown in figure 8B of the '441 patent, which is shown below,

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should be compared to the histograms of the angles of the edges of the marks, an example of which is shown below:



Hirose (the '441 patent) does not teach or disclose or suggest line segment data that comprises line segment angle data, a limitation of amended claim 1, amended claim 8 and amended claim 14. The '584 patent also does not teach, disclose or suggest line segment data that comprises line segment angle data.

The Examiner states that in the process of identifying the location of the plurality of benchmarks from the histogram data, as taught by Hirose in col. 5, lines 30-46, "Edge mark detectors 89, 90 determine whether each repetition rate and/or position $P_{sub.0}$, $P_{sub.1}$. . . $P_{sub.n}$ of the peak value of the histogram for each edge marking $E_{sub.0}$, $E_{sub.1}$. . . $E_{sub.n}$ of each edge mark detection area supplied from the respective peak value detectors 87, 88 is within the limits of a characteristic location pattern of a standard edge marking (FIG. 8D) stored in matching tables 89a, 90a. In other words, a match is determined between the location of peak values $P_{sub.0}$, $P_{sub.1}$. . . $P_{sub.n}$ and the range of coordinates ($P_{sub.0min}$ - $P_{sub.0max}$, $P_{sub.1min}$ - $P_{sub.1max}$, . . .) of the characteristic reference edge pattern shown in FIG. 8D. Based on this decision, edge mark detectors 89 and 90 determine whether the period of repetition of the peak

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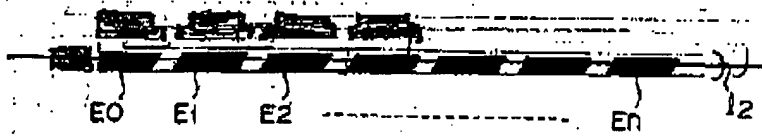
values of the histogram is constant or not. When this period of repetition is determined to be constant and match characteristic reference locations, an edge mark is determined to be present;" is analogous to "identifying a plurality of collinear line segments from the line segment data," a limitation of claim 1.

Applicants respectfully state that, based on the significant difference between the area-based histograms obtained by Hirose (the '441 patent) and the angle-based histograms used to identify the collinear line segments, and based on the fact that the '441 patent does not teach utilizing collinear line segments, the process of identifying the location of the edge marks in the '441 patent from area histograms is not analogous to the process of identifying a plurality of collinear line segments from the line segment data.

Furthermore, Applicants respectfully state that the purported analogy is not based on "substantial evidence" (in the '441 patent, histograms of areas of the Chevron marks rebounded between the edge of the envelope and a predetermined line are used to determine the location of the Chevron marks. There is no reference into '441 patent to collinear line segments or lined segment data. Although some embodiments of the Applicants' method for identifying collinear line segments could use histograms, as understood by one skilled in the image processing or image identification art, areas are significantly different from line segments. Therefore, one skilled in the image processing or image identification art, would not find a process for determining the location of areas analogous to a process for identifying collinear line segments. Applicants respectfully traverse the Examiner's assertion.

As the Examiner states, Matsumoto (the '584 patent) teaches an image processing method which can identify ruled lines which construct a table. In the method taught by the '584 patent histograms from the image area are generated in the horizontal or vertical direction and using the peak position coordinates of the histograms, intersected lines identified. Applying the teachings of the 584 patent to the edge mark image of the 441 patent (figure 8A), the following result is obtained, shown in the figure below.

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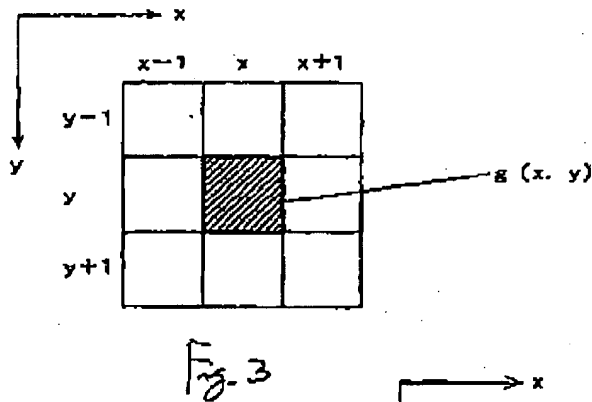
The intersections of the centers of the vertical and horizontal histograms would be at one point roughly in the center of each of the edge marks. Such information would not be useful to determine "the distance from the edge of the envelope to the average or maximum value of each mark" in order to determine a distance from the edge of the envelope in which "no edge mark is included." Such a determination is necessary in order to "provide a reading apparatus that can accurately determine the reverse/obverse of postal material and determine whether the postal material is right side up or upside down, in spite of partial overlapping of an edge mark with marks which are critical to these determinations," the purpose for which the invention this close in the '441 patent is intended for.

Since combining the teachings of the '584 patent with the teachings of the 441 patent renders the 441 patent unsuitable for the purpose it was intended for, the '584 patent teaches away from the combination. "If when combined, the references "would produce a seemingly inoperative device," then they teach away from their combination. *In re Spinnoble*, 56 C.C.P.A. 823, 405 F.2d 578, 587, 160 U.S.P.Q. (BNA) 237, 244 (CCPA 1969); see also *In re Gordon*, 733 F.2d 900, 902, 221 U.S.P.Q. (BNA) 1125, 1127 (Fed. Cir. 1984) (finding no suggestion to modify a prior art device where the modification would render the device inoperable for its intended purpose)" (as cited in *Tec-Air Inc. v. Denso Manufacturing*, 192 F.3d 1353, 1360 (fed. Cir. 1999).

The Examiner states that neither the '441 patent nor the '584 patent describer histogram that displays a number of line segments in a predetermined angular range and refers to Fujieda for such teaching. Fujieda obtained the angles by scanning each independent image with a small mask (a 3 x 3 mask is used, a large mask would take features from another independent image, also, since a gradient is desired, there are a number of mathematical considerations for using a

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small mask). Fujieda defines edge codes in paragraph 58 by "The angle of rotation in the counter-clockwise direction from Vector B to Vector C is defined as the edge code $E_c(x,y)$ of the edge pixel E." As described in paragraph 60 of Fujieda, a histogram of edge codes is created. As stated in paragraph 62 of Fujieda, the peaks of the histogram identified the edge code. As stated in paragraph 66, line segments in the independent image corresponding to the same edge code are assigned the same label. However, the difference between edge codes and angles is significant. Consider the mask described by Fujieda (figure 3 of Fujieda), the independent image and the resulting identification of angles (given in figures 5-a, 5b, 6a,6b of Fujieda), which are shown below.



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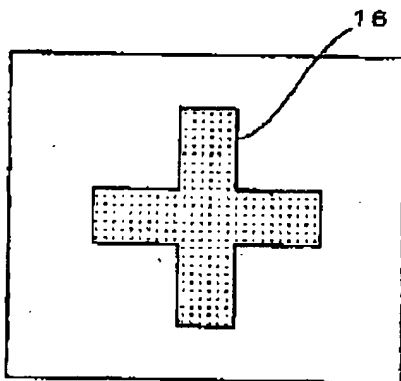


Fig. 5A

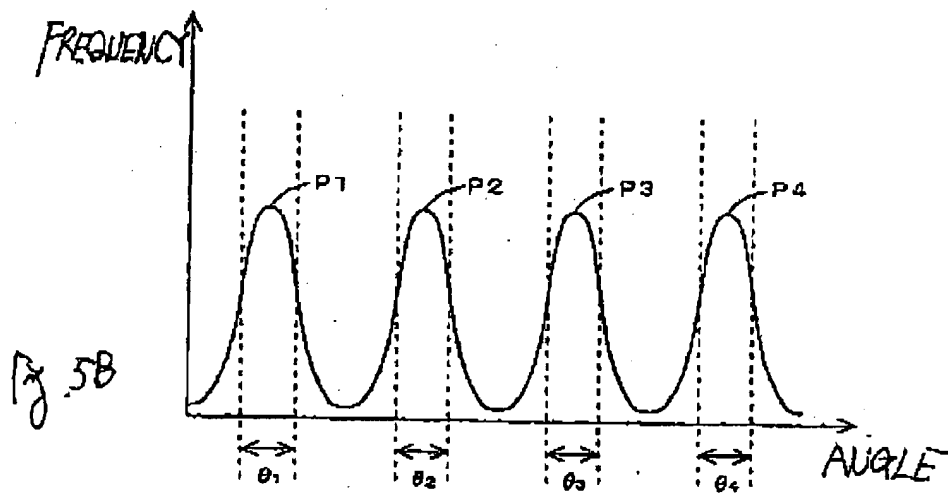


Fig. 5B

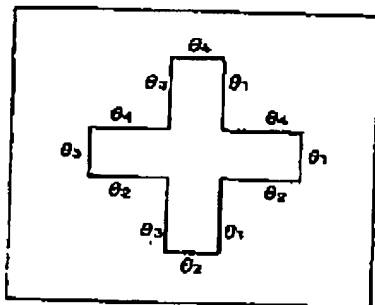


Fig. 6A

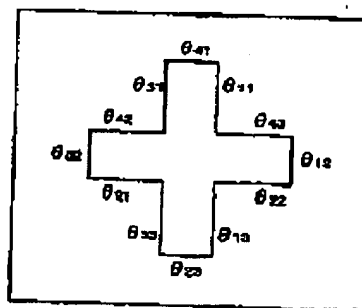
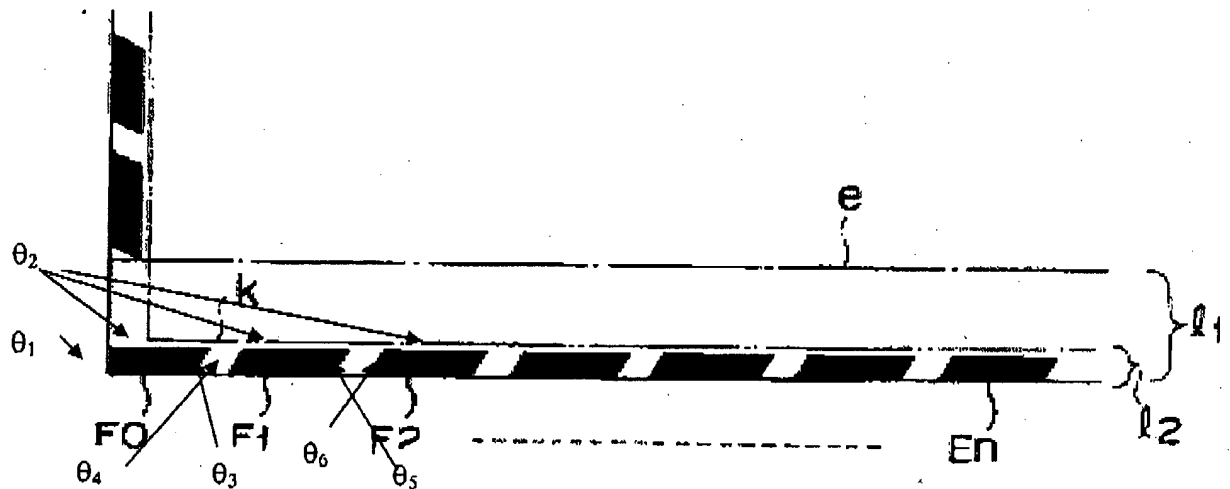


Fig. 6B

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Applying the teachings of Fujieda to the independent images of the bottom of Figure 8A of the 441 patent, the following results are obtained (recalling the difference between edge codes and angles.

FIG. 8A



Even assuming equality of edge codes and angles, such information would not be useful to determine "the distance from the edge of the envelope to the average or maximum value of each mark" in order to determine a distance from the edge of the envelope in which "no edge mark is included." Such a determination is necessary in order to "provide a reading apparatus that can accurately determine the reverse/obverse of postal material and determine whether the postal material is right side up or upside down, in spite of partial overlapping of an edge mark with marks which are critical to these determinations," the purpose for which the invention this close in the '441 patent is intended for.

Since combining the teachings of the '411 patent with the teachings of Fujieda renders the '441 patent unsuitable for the purpose it was intended for, Fujieda teaches away from the combination. "If when combined, the references "would produce a seemingly inoperative device," then they teach away from their combination. In re Spinnoble, 56 C.C.P.A. 823, 405

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F.2d 578, 587, 160 U.S.P.Q. (BNA) 237, 244 (CCPA 1969); see also *In re Gordon*, 733 F.2d 900, 902, 221 U.S.P.Q. (BNA) 1125, 1127 (Fed. Cir. 1984) (finding no suggestion to modify a prior art device where the modification would render the device inoperable for its intended purpose)" (as cited in *Tec-Air Inc. v. Denso Manufacturing*, 192 F.3d 1353, 1360 (fed. Cir. 1999).

The combination does not become a more attractive in both the angle histogram of Fujieda and the line histogram of the '584 patent. Using both of the histograms, angle histogram of Fujieda and the line histogram of the '584 patent, still does not provide means for determining "the distance from the edge of the envelope to the average or maximum value of each mark" in order to determine a distance from the edge of the envelope in which "no edge mark is included."

Applicants respectfully state that a prima facie case of obviousness has not been established since the prior art does not teach all the limitations of claim 1, 8 or 14, and the prior art teaches away from the combination.

IV. Claim Rejections – 35 USC §101

Claims 14-18 are rejected under 35 USC 101 because the claimed invention is directed to nonstatutory subject matter.

Regarding claims 14-18, the following arguments are presented regarding the statutory nature of computer usable medium, including carrier waves. While a signal claim per se was held to be nonstatutory by the Court of Appeals for the Federal Circuit in *In re Nuijten* (*In re Nuijten*, No. 2006-1371 (Fed. Cir. Sept. 20, 2007)), in *Ex parte Nuijten*, 84 USPQ 2d 1335,1339, the Board of Patent Appeals and Interferences (BPAI) held that a claim reciting "a storage medium having stored thereon a signal with embedded supplemental data" was statutory based on *Lowry*. (See also *In re Nuijten*, No. 2006-1371 (Fed. Cir. Sept. 20, 2007)). At oral argument [in *Nuijten*], the PTO invoked *In re Lowry* and *In re Beauregard* in the context of why *Nuijten*'s claim 15, to "a storage medium having stored thereon" a signal, was allowable even though (according to the PTO) claim 14, to the signal, was not. Oral Arg. at 00:44:41–00:45:18, available at <http://www.caftc.uscourts.gov/oralarguments/mp3/06-1371.mp3> (citing *In re Lowry*, 32 F.3d 1579

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(Fed. Cir. 1994), and *In re Beauregard*, 53 F.3d 1583 (Fed. Cir. 1995) (order))." (*Nuijten*, No. 2006-1371 (Fed. Cir. Sept. 20, 2007)).

Based on *Lowry*, *Beauregard*, and the comments made by the USPTO at oral argument in *Nuijten*, claim 14 is in the form of *In re Beauregard* and claims a computer program product including a storage medium having computer readable code embedded therein and, as stated by the PTO during arguments in *In re Nuijten*, claim 1 recites statutory matter.

The USPTO position at oral argument and the BPAI decision on claim 15 in *ex parte Nuijten* are in consonance with the position expressed in the MPEP regarding software code limitations in a statutory system. As stated in section 2106.01 of the MPEP, "USPTO personnel should determine whether the computer program is being claimed as part of an otherwise statutory manufacture or machine. In such a case, the claim remains statutory irrespective of the fact that a computer program is included in the claim. The same result occurs when a computer program is used in a computerized process where the computer executes the instructions set forth in the computer program. Only when the claimed invention taken as a whole is directed to a mere program listing, i.e., to only its description or expression, is it descriptive material per se and hence nonstatutory." By a similar argument, a nonstatutory equivalent of the computer usable medium is a limitation in a claim for statutory computer program product and, therefore, the claimed subject matter remains statutory.

Assuming, arguendo, that a computer usable medium as stated in *In re Beauregard* is only statutory for devices such as floppy disks, rigid magnetic disks, magnetic tape, optical tape, optical recording discs, punched tape or cards, or the like results in legal contradictions as presented herein below.

A. Taking arguendo the interpretation proposed by the Examiner, a computer usable memory has non-statutory equivalents under the Doctrine of Equivalents. (If a claimed invention is statutory, can the equivalents - that provide the same function, in the same way, to obtain the same result - be nonstatutory?)

As the proposed guidelines state, a carrier wave having computer readable code embodied therein serves the same purpose, creating a functional interrelationship with a computer, as a computer readable memory and obtains the same result, the computer is able to

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execute the encoded functions. Also, a carrier wave having computer readable code embodied therein performs that same purpose in the same way as a computer readable memory having computer readable code embodied therein; both carry bits of information and both operate as communication channels (see for example, Wolf, J.K., *Magnetic recording as a communications channel*, 1994 IEEE International Symposium on Information Theory, 1994. Proceeding, 27 June-1 July 1994 Page(s):5 or Moon, J., *Signal-to-noise ratio definition for magnetic recording channels with transition noise*, IEEE Transactions on Magnetics, Volume 36, Issue 5, Part 2, Sept 2000 Page(s):3881, 3883).¹ (See also Siegel, P.H.; Wolk, J.K., *Modulation and coding for information storage*, IEEE Communications Magazine, Volume 29, Issue 12, Date: Dec 1991, Pages:68 – 86, a copy of which is attached in the Appendix.) The carrier wave having computer readable code embodied therein obtains the same result, i.e. to enable a computer to provide a useful result by executing the code, as a computer readable memory having computer readable code embodied therein.

An accused product or process may infringe a patent either literally or under the Doctrine of Equivalents. To literally infringe a patent claim, the product or process at issue must include each and every element of the claim. *Builders Concrete, Inc v. Bremerton Concrete Products*, 757 F.2d 255, 257 (Fed. Cir. 1985). In the event of failing to meet the standards established for demonstrating a *prima-facie* case of literal infringement, the analysis then proceeds to another theory of infringement – the Doctrine of Equivalents.

The Doctrine of Equivalents enables protect patent owners relief against infringers' making "unimportant and insubstantial changes" to a patented invention which "though adding nothing, would be enough ... [to evade] the reach of the law." *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 606, 70 S.Ct. 854, 856, 94 L.Ed. 1097 (1950). The doctrine may result in a virtual expansion of the scope of a patentee's claims in certain circumstances where, although it is shown that the literal language of a claim's elements is not met by an accused product, it may be proven that the accused product, analyzed on an element by element basis, "performs substantially the same overall function or work, in substantially the same way, to obtain substantially the same overall result as the claimed invention." *Pennwalt Co. v. Durand-Wayland Inc.*, 833 F.2d 931, 934 (Fed. Cir. 1987).

¹ Copies of the above cited pages of the Wolf and Moon articles have been previously provided.

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Therefore, infringement under the Doctrine of Equivalents requires that each corresponding element of the accused apparatus, device, composition or process, that is not literally met by a limitation of a claim, performs substantially the same function in substantially the same way to yield the same, or substantially the same, result as each corresponding limitation of the claim. *Graver Tank & Mfg. Co., Inc. v. Linde Air Products, Co.*, 339 U.S. 605; *Perkin-Elmer Co. v. Computervision Corp.* 732 F.2d 888, (Fed. Cir. 1984), *cert. denied*, 469 U.S. 857 (1984); *Pennwalt Co. v. Durand-Wayland, Inc.*, 833 F. 2d at 934 (Fed. Cir. 1987), *cert. denied*, 485 U.S. 961 (1988), and *cert. denied*, 485 U.S. 1009 (1988).²

As stated above and considering the law summarized here, a claim allowed before the mid-1990s reciting a computer usable memory having computer readable code embodied therein might protect against an infringing product utilizing a carrier wave (such as the Internet) to perform the same function since such a product would infringe under the Doctrine of Equivalents unless subject to one or more of the other Doctrine of Equivalents limitations. Since the carrier wave is an after developed technology, limitations of the Doctrine of Equivalents place by *Warner-Jenkinson* and *Festo* and preceding cases might not apply to pre mid-1990s while those limitations of the Doctrine of Equivalents would apply to the Applicant's claims.

Therefore, the application of the proposed guidelines to claims for computer program product comprising computer readable medium would render effective coverage of claims dependent on when the claim was written. This is an anomaly inconsistent with the clarifying purpose of the proposed guideline. Furthermore, the anti-carrier wave feature of the proposed guidelines presents a situation where, if the applicant does not explicitly list that a carrier wave is a computer usable medium, a claim for a computer usable medium, which is identical to the claims in *In re Beauregard* would protect against products using a carrier wave to embody computer readable code by means of the Doctrine of Equivalents while applicants who are more explicit in their definition of a computer usable medium would have their claims rejected,

² The use of Doctrine of Equivalents can also be further burdened by file wrapper estoppel (*Warner-Jenkinson Co. v. Hilton-Davis Chem. Co.*, 520 U.S. 17 (1997) and *Festo Corp. v. Shoketsu Kinzokyo Kogyo Kaboshiki Co. Ltd.*, 535 U.S. ____ (2002); alleged disclaimers (*Johnson & Johnson Assocs. v. U.R.E. Serv. Co.*, 285 F.3d 1046 (Fed. Cir. 2002) (*en banc*); and by prior art limits (*Wilson Sporting Goods Co. v. David Geoffrey Assoc.*, 904 F.2d 677 (Fed. Cir. 1990) and if and when "means for" limitations per 35 U.S.C. § 112 (6th par.) are deemed to be involved, by the interaction of that paragraph with the Doctrine of Equivalents as explained, e.g., in *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308 (Fed. Cir. 1999).²

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rendered patentable only by a narrowing amendment and therefore would be blocked by File Wrapper Estoppel from access to the Doctrine of Equivalents under *Festo*.

The application of the Annex IV of the proposed guidelines to claims for computer program products comprising a computer usable medium presents a novel situation in patent law where a bona fide equivalent (under the Doctrine of Equivalents) is declared to be nonstatutory. Such a situation would be a case of first impression and is counter to applying the known law for determining compliance with 35 USC 101.

B. The Cross Border Infringement Issue

In *NTP Inc. v. Research in Motion, Inc.*, 418 F.3d 1282, 75 USPQ 2d 1763 (Fed. Cir. 2005) it was well explained that the steps of utilization of the Blackberry® system occurring partially in Canada did not infringe method claims of the patents in suit but that such usage did infringe apparatus (system) claims. 75 USPQ 2d at 1786-93. Nor did the defendant (nor customers of defendant induced by defendant) infringe by "exports" of text and voice message encoded signals to Canada under 35 U.S.C. § 271(f) [75 USPQ 2d at 1793-94] nor commit import of product-by-process infringement under 35 U.S.C. § 271(g) [75 USPQ 2d at 1794-95]. Since under *NTP v RIM* methods claims do not provide protection against extra-territorial infringers, Applicant's protection would only be based on the system claim that is practiced by the user not the extra-territorial provider of the software.

On the other hand in *Eolas Tech Inc. v. Microsoft Corp.*, 399 F.3d 1375, 73 USPQ 2d 1782 (Fed. Cir. 2005) and *AT&T Corp. v. Microsoft Corp.*, 414 F.3d 1366, 75 USPQ 2d 1506 (Fed. Cir. 2001) shipment of software on disks and indeed on a master disk and also as signals to Europe to be copied, with copies to be bundled with European made, sold, used computers did infringe a U.S. patent under the 35 U.S.C. § 271(f) export provisions. In *AT&T*, the Federal Circuit observed (75 USPQ 2d at 1509-10):

"Were we to hold that Microsoft's supply by exportation of the master versions...avoids infringement we would be subverting the remedial nature of §271(f), permitting a technical avoidance of the statute by ignoring the advances in a field of technology – and its associated industry practices – that developed after the enactment of §271(f). It would be unsound to construe a statutory provision that was originally enacted to encourage advances in technology by closing a loophole, in a manner that allows the very advances in technology thus

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encouraged to subvert that intent. Section 271(f), if it is to remain effective must therefore be interpreted in a manner that is appropriate to the nature of the technology at issue...."

The Federal Circuit's decision is consistent with a situation of streaming code abroad via the Internet rather than shipping a master disk. As stated by the Federal Circuit, "Additionally, we cannot accept Microsoft's suggestion that software sent by electronic transmission must be treated differently for purposes of § 271(f) liability from software shipped on disks, see Tr. of Dec. 12, 2003 Hearing, at 8:8-17 (J.A. 351), as it would amount to an exaltation of form over substance. " *ATT v. Microsoft*, 414 F. 3d 1366 (2005).

A petition for *Certiori* was granted October 28, 2006 and Federal Circuit decision was reversed on other grounds. *Microsoft v. ATT*, 550 U. S. ____ (2007), Decided April 30, 2007. As stated in the U.S. Supreme Court decision, "Until it is expressed as a computer-readable .copy,. e.g., on a CD-ROM, Windows software indeed any software detached from an activating medium remains uncombinable." *Id.*

The patent in question in *ATT v. Microsoft*, RE32580, was re-issued in 1988 before the *In re Lowry* and in *In re Beauregard* decisions and therefore does not have a *Beauregard* type claim. A *Beauregard* type claim would have avoided the controversy since, in claiming the software as being embodied in a computer readable medium (copy), the master disk (or the signal transmission, using the Federal Circuit statement) would have been the claimed invention and Microsoft would have been shipping an infringing product.

Under the application of the proposed Interim guidelines advocated by the Examiner, transmission of software overseas to be bundled with a European made computer would not infringe while shipping a physical medium with the claimed software embodied therein would infringe. Therefore, the proposed Interim guidelines run counter to the statement by the Federal Circuit and permit "a technical avoidance of the statute by ignoring the advances in a field of technology." Also, in the words of the Federal Circuit, the proposed guidelines place to form over substance allowing infringers to use this form over substance guidelines to infringe without consequence.

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Should the Examiner interpret the proposed guidelines in order to enable infringers to escape the statute by using advances in a field of technology that produce equivalents to the claimed invention?

Applicants respectfully state that such a rejection would be counter to the Constitutional basis of the patent statute.

The use of carrier waves (the Internet) for distribution and execution of software is a relatively new technology. See for example, Microsoft's decision to use the Internet for distribution of software as described in <http://www.microsoft.com/presspass/press /1996/may96/esdpr.mspx> or the use of CORBA or DCOM for distributed software execution involving a transmission from server to client which can happen via a carrier wave (the CORBA and DCOM definitions date to the mid-1990s) or the use of applets (also dating to the mid-1990s). No question of enablement, written description, best mode or anticipation/obviousness in relating to prior art is presented by claims 14-18.

For the reasons stated above, Applicants respectfully state that the claimed invention of claim 14 is statutory. Claims 15-18 are dependent on claim 14 and, therefore, are also statutory.

V. Conclusion

Applicants respectfully submit that the above claims and remarks clearly establish the patentability of the claimed invention over the prior art. Favorable consideration and allowance are earnestly solicited. No fee is required, however the Commissioner for Patents is hereby authorized to charge any deficiencies to or credit any overpayment to Deposit Account No. 03-2410, Order No. 12078-195.

The following information is presented in the event that a call may be deemed desirable by the Examiner:

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Respectfully submitted,
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